UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/325,099	06/03/1999	ALEXANDER SHVARTS	4498	2396

7590 06/20/2002

MATTHEW E CONNORS
SAMUELS GAUTHIER & STEVENS LLP
225 FRANKLIN STREET
SUITE 3300
BOSTON, MA 02110

EXAMINER	
FAN, CHIEH M	
ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 06/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/325,099	SHVARTS ET AL.	
	Examiner	Art Unit	
	Chieh M Fan	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 June 1999* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 June 1999* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: a feedback signal 64 (see page 4, line 16), a local oscillator signal 56 (see page 5, lines 15-16) and a local oscillator signal 76 (see page 8, line 18).

Furthermore, according to the specification (page 5, line 9), filter 48 is a low pass filter, but the filter illustrated in Fig. 2 is a band pass filter. The filter 48 in Fig. 2 needs to be changed to a low pass filter.

The drawings are also objected to because Figs. 2 and 3 include elements that only have numbers but no labels. The elements have numbers associated with them but no labels to tell a reader what they do without referring to the disclosure, and their functions are not apparent from the boxes used to represent them. Therefore, it is suggested that the element 58 in Fig. 2 and the elements 70, 72, 82, 84, 86, 88, 98, 100, 102, 108, 110, 112, 114, 118, 124, 132, 134, 142, 146 and 152 in Fig. 3 should be labeled.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The word “disclosed” in line 1 of the abstract should be changed.

Claim Objections

3. Claims 5-7, 14-16 and 18 are objected to because of the following informalities:

Regarding claim **5**, “said reference unit” in line 2 should be changed to “said reference signal”.

Regarding claims **6** and **7**, the limitations “a first signal” (line 2), “a first frequency” (line 3), “a second signal” (line 3), and “a second frequency” (line 4) in claim 6 have already been recited in claim 4. Therefore, the examiner suggests that

a. “a first signal” in line 2 of claim 6 should be changed to “a third signal”;

b. "a first frequency" in line 3 of claim 6 should be changed to "a third frequency";

c. "a second signal" in line 3 of claim 6 should be changed to "a fourth signal";

d. "said first signal" in lines 3-4 of claim 6 should be changed to "said third signal";

e. "said second signal" in line 2 of claim 6 should be changed to "said fourth signal";

f. "a second frequency" in line 4 of claim 6 should be changed to "a fourth frequency"; and

g. "said first signal" in line 5 of claim 6 should be changed to "said third signal".

Regarding claim **14**, "said reference unit" in line 2 should be changed to "said reference signal".

Regarding claims **15** and **16**, the limitations "a first signal" (line 2), "a first frequency" (line 3), "a second signal" (line 3), and "a second frequency" (line 4) in claim 15 have already been recited in claim 13. Therefore, the examiner suggests that

h. "a first signal" in line 2 of claim 15 should be changed to "a third signal";

i. "a first frequency" in line 3 of claim 15 should be changed to "a third frequency";

j. "a second signal" in line 3 of claim 15 should be changed to "a fourth signal";

k. "said first signal" in lines 3-4 of claim 15 should be changed to "said third signal";

l. "said second signal" in line 2 of claim 15 should be changed to "said fourth signal";

m. "a second frequency" in line 4 of claim 15 should be changed to "a fourth frequency"; and

n. "said first signal" in line 5 of claim 15 should be changed to "said third signal".

Regarding claim **18**, claim 18 is identical with claim 9. It appears that claim 18 should depend on claim 17.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1, 4-10 and 13-19 are rejected under 35 U.S.C. 102(a) as being anticipated by Herzinger (EP 0,905,879, an English abstract is also attached).

Regarding claim **1**, Herzinger discloses a translation loop modulator (see Fig. 2 and the English abstract) for transmission circuit in a communication system, said translation loop modulator comprising:

input modulation means ("QM" and "BP" in Fig. 2) for receiving at least one input signal ("f_I" and "f_Q" in Fig. 2) that is representative of information to be modulated, for receiving a feedback signal ("f_{MO}" in Fig. 2), and for producing an intermediate modulated signal (output from "BP" in Fig. 2) responsive to said input signal and said feedback signal;

comparator means ("FT1", "FT2", "PFD", "CP", "LF" and "HF-VCO" in Fig. 2) for receiving said intermediate modulated signal (output from "BP" in Fig. 2) and a reference signal ("f_{LO}" in Fig. 2), and for producing an output transmission signal ("A" in Fig. 2) responsive to said intermediate modulated signal and said reference signal; and

feedback circuitry ("M1" and "TP" in Fig. 2) coupled to said output transmission signal ("A" in Fig. 2), coupled to said reference signal ("f_{LO}" in Fig. 2) and coupled to said input modulation means ("QM" and "BP" in Fig. 2), said feedback circuitry for producing said feedback signal ("f_{MO}" in Fig. 2) responsive to said output transmission signal and said reference signal.

Regarding claim **4**, Herzinger also teaches that said comparator means ("FT1", "FT2", "PFD", "CP", "LF" and "HF-VCO" in Fig. 2) includes at least one frequency divider unit ("FT2" in Fig. 2) including an input port for receiving a first signal ("f_{LO}" in Fig. 2) having a first frequency, and an output port for producing a second signal ("f_{PD}" in Fig. 2) responsive to said first signal, said second signal having a second frequency of a

predetermined relationship to the frequency of said first signal (the ratio of the first frequency and the second frequency is R).

Regarding claim **5**, Herzinger also teaches said input port of said frequency divider unit ("FT2" in Fig. 2) is coupled to said reference signal ("f_{LO}" output from "LO" in Fig. 2), and said output port of said frequency divider unit is coupled to a phase comparator device ("PFD" in Fig. 2).

Regarding claim **6**, Herzinger also teaches said comparator means ("FT1", "FT2", "PFD", "CP", "LF" and "HF-VCO" in Fig. 2) includes a second frequency divider unit ("FT1" in Fig. 2) including an input port for receiving a third signal (the output from "BP" in Fig. 2) having a third frequency, and an output port for producing a fourth signal (the output from "FT1" in Fig. 2) responsive to said third signal, said fourth signal having a fourth frequency of a predetermined relationship to the frequency of said third signal (the ratio of the third frequency and the fourth frequency is N).

Regarding claim **7**, Herzinger also teaches said input port of said second frequency divider unit ("FT1" in Fig. 2) is coupled to said intermediate modulated signal (the output from "BP" in Fig. 2), and said output port of said second frequency divider unit is coupled to a phase comparator device ("PFD" in Fig. 2).

Regarding claim **8**, Herzinger also teaches said feedback circuitry ("M1" and TP" in Fig. 2) includes a mixer device ("M1" in Fig. 2) including a first input port coupled to said output transmission signal ("A" in Fig. 2), a second input port coupled to said reference signal ("f_{LO}" in Fig. 2), and an output port coupled to said feedback signal ("f_{MO}" in Fig. 2).

Regarding claims **9** and **18**, Herzinger also teaches said reference signal is directly connected to said mixer device (as seen in Fig. 2, the reference signal "f_{LO}" is directly connected to the mixer device "M1").

Regarding claim **10**, Herzinger teaches a translation loop modulator (see Fig. 2 and the English abstract) for a transmission circuit in a communication system, said translation loop modulator comprising:

quadrature modulation means ("QM" and "BP" in Fig. 2) for receiving at least one input signal ("f_I" and "f_Q" in Fig. 2) that is representative of information to be modulated, for receiving a feedback signal ("f_{MO}" in Fig. 2), and for producing an quadrature modulated signal (output from "BP" in Fig. 2) responsive to said input signal and said feedback signal;

phase comparator means ("FT1", "FT2", "PFD", "CP", and "LF" in Fig. 2) for receiving said quadrature modulated signal (output from "BP" in Fig. 2) and a reference signal ("f_{LO}" in Fig. 2), and for producing a phase comparator signal (output from "LF" in Fig. 2) responsive to said quadrature modulated signal and said reference signal;

oscillator means ("HF-VCO" in Fig. 2) for receiving said phase comparator signal (output from "LF" in Fig. 2), and for producing an output transmission signal ("A" in Fig. 2) responsive to said phase comparator signal; and

feedback circuitry ("M1" and "TP" in Fig. 2) coupled to said output transmission signal ("A" in Fig. 2), coupled to said reference signal ("f_{LO}" in Fig. 2) and coupled to said quadrature modulation means ("QM" and "BP" in Fig. 2), said feedback circuitry for

producing said feedback signal ("f_{MO}" in Fig. 2) responsive to said output transmission signal and said reference signal.

Regarding claim **13**, Herzinger also teaches that said comparator means ("FT1", "FT2", "PFD", "CP", and "LF" in Fig. 2) includes at least one frequency divider unit ("FT2" in Fig. 2) including an input port for receiving a first signal ("f_{LO}" in Fig. 2) having a first frequency, and an output port for producing a second signal ("f_{PD}" in Fig. 2) responsive to said first signal, said second signal having a second frequency of a predetermined relationship to the frequency of said first signal (the ratio of the first frequency and the second frequency is R).

Regarding claim **14**, Herzinger also teaches said input port of said frequency divider unit ("FT2" in Fig. 2) is coupled to said reference signal ("f_{LO}" output from "LO" in Fig. 2), and said output port of said frequency divider unit is coupled to a phase comparator device ("PFD" in Fig. 2).

Regarding claim **15**, Herzinger also teaches said comparator means ("FT1", "FT2", "PFD", "CP", and "LF" in Fig. 2) includes a second frequency divider unit ("FT1" in Fig. 2) including an input port for receiving a third signal (the output from "BP" in Fig. 2) having a third frequency, and an output port for producing a fourth signal (the output from "FT1" in Fig. 2) responsive to said third signal, said fourth signal having a fourth frequency of a predetermined relationship to the frequency of said third signal (the ratio of the third frequency and the fourth frequency is N).

Regarding claim **16**, Herzinger also teaches said input port of said second frequency divider unit ("FT1" in Fig. 2) is coupled to said intermediate modulated signal

(the output from "BP" in Fig. 2), and said output port of said second frequency divider unit is coupled to a phase comparator device ("PFD" in Fig. 2).

Regarding claim **17**, Herzinger also teaches said feedback circuitry ("M1" and TP" in Fig. 2) includes a mixer device ("M1" in Fig. 2) including a first input port coupled to said output transmission signal ("A" in Fig. 2), a second input port coupled to said reference signal ("f_{LO}" in Fig. 2), and an output port coupled to said feedback signal ("f_{MO}" in Fig. 2).

Regarding claim **19**, Herzinger teaches a translation loop modulator (see Fig. 2 and the English abstract) for a transmission circuit in a communication system, said translation loop modulator comprising:

quadrature modulation means ("QM" and "BP" in Fig. 2) for receiving at least one input signal ("f_I" and "f_Q" in Fig. 2) that is representative of information to be modulated, for receiving a feedback signal ("f_{MO}" in Fig. 2), and for producing an quadrature modulated signal (output from "BP" in Fig. 2) responsive to said input signal and said feedback signal;

first frequency divider means ("FT1" in Fig. 2) for receiving said quadrature modulated signal (output from "BP" in Fig. 2), and for producing a first frequency divided signal (output from "FT1" in Fig. 2) responsive to said quadrature modulated signal;

second frequency divider means ("FT2" in Fig. 2) for receiving a reference signal ("f_{LO}" in Fig. 2), and for producing a second frequency divided signal ("f_{PD}" in Fig. 2) responsive to said reference signal;

phase comparator means ("PFD", "CP", and "LF" in Fig. 2) for receiving said first frequency divided signal and said second frequency divided signal, and for producing a phase comparator signal (output from "LF" in Fig. 2) responsive to said first and second frequency divided signals;

oscillator means ("HF-VCO" in Fig. 2) for receiving said phase comparator signal (output from "LF" in Fig. 2), and for producing an output transmission signal ("A" in Fig. 2) responsive to said phase comparator signal; and

feedback circuitry coupled to said output transmission signal, coupled to said reference signal and coupled to said quadrature modulation means, said feedback circuitry for producing said feedback signal responsive to said output transmission signal and said reference signal.

feedback circuitry ("M1" and "TP" in Fig. 2) coupled to said output transmission signal ("A" in Fig. 2), coupled to said reference signal ("f_{LO}" in Fig. 2) and coupled to said quadrature modulation means ("QM" and "BP" in Fig. 2), said feedback circuitry for producing said feedback signal ("f_{MO}" in Fig. 2) responsive to said output transmission signal and said reference signal.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 2, 3, 11, 12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herzinger (EP 0,905,879) in view of Jaffe (US Patent 5,130,670).

Regarding claim **2**, Herzinger teaches the claimed invention (see the rationale applied to claim 1 above) including an oscillating means ("LO" in Fig. 2) for generating the reference signal ("f_{LO}" in Fig. 2), but fails to teach that the oscillating means is a reference loop modulator, i.e., a feedback loop configuration.

Jaffe teaches that an oscillating means (16' in Fig. 4) is implemented with a phase locked loop (52', 54', 56', 58', 66, 64', 60' and 62' in Fig. 7). The phase locked loop comprises a stability enhancement circuit (66 in Fig. 7) so as to generate a stable output oscillating signal.

It is desirable to generate a stable reference signal in the translation loop modulator of Herzinger so as to generate a stable output transmission signal ("A" in Fig. 2 of Herzinger). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the oscillating means of Herzinger with a phase locked loop, as taught by Jaffe, so as to generate a stable reference signal and consequently to generate a stable output transmission signal.

Regarding claim **3**, Jaffe teaches the claimed limitation "said reference loop modulator includes a fractional n synthesizer" because Jaffe teaches that the oscillating means 16' is a fractional n synthesizer (col. 16, lines 62-63).

Regarding claim **11**, Herzinger teaches the claimed invention (see the rationale applied to claim 10 above) including an oscillating means ("LO" in Fig. 2) for generating

the reference signal ("f_{LO}" in Fig. 2), but fails to teach that the oscillating means is a reference loop modulator, i.e., a feedback loop configuration.

Jaffe teaches that an oscillating means (16' in Fig. 4) is implemented with a phase locked loop (52', 54', 56', 58', 66, 64', 60' and 62' in Fig. 7). The phase locked loop comprises a stability enhancement circuit (66 in Fig. 7) so as to generate a stable output oscillating signal.

It is desirable to generate a stable reference signal in the translation loop modulator of Herzinger so as to generate a stable output transmission signal ("A" in Fig. 2 of Herzinger). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the oscillating means of Herzinger with a phase locked loop, as taught by Jaffe, so as to generate a stable reference signal and consequently to generate a stable output transmission signal.

Regarding claim **12**, Jaffe teaches the claimed limitation "said reference loop modulator includes a fractional n synthesizer" because Jaffe teaches that the oscillating means 16' is a fractional n synthesizer (col. 16, lines 62-63).

Regarding claim **20**, Herzinger teaches the claimed invention (see the rationale applied to claim 19 above) including an oscillating means ("LO" in Fig. 2) for generating the reference signal ("f_{LO}" in Fig. 2), but fails to teach that the oscillating means is a reference loop modulator, i.e., a feedback loop configuration.

Jaffe teaches that an oscillating means (16' in Fig. 4) is implemented with a phase locked loop (52', 54', 56', 58', 66, 64', 60' and 62' in Fig. 7). The phase locked

loop comprises a stability enhancement circuit (66 in Fig. 7) so as to generate a stable output oscillating signal.

It is desirable to generate a stable reference signal in the translation loop modulator of Herzinger so as to generate a stable output transmission signal ("A" in Fig. 2 of Herzinger). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the oscillating means of Herzinger with a phase locked loop, as taught by Jaffe, so as to generate a stable reference signal and consequently to generate a stable output transmission signal.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Jesse et al. (US Patent 3,958,186), Lampe (US Patent 5,313,173), Knoedl, Jr., et al. (US Patent 5,966,055) and Black et al. (US Patent 6,157,271) teach phase locked loop transmitter systems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (703) 305-0198. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (703) 305-4714. The fax phone numbers

for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4750.

Chieh M Fan
Examiner
Art Unit 2634

cmf
June 15, 2002